Claims

1. Ceramic multi-layer filter made of at least two layers of the same or different ceramic materials with a different particle size of the ceramic particles in the individual layers, where one layer is a support layer and at least one other layer is present as a layer with ceramic material with a smaller particle size, in which the particle surfaces of all ceramic particles in the layers are wet entirely or partially with at least one material, which wets the surface of the ceramic particles well and has the same or approximately the same thermal coefficient of expansion as the ceramic particles, and the particle size, particle morphology and particle composition/crystal structure is not altered or only slightly altered compared to those of the powder that is used and in which spot and/or surface connections are formed between the particles, where the pore volume and pore size between the particles is reduced by the material only slightly or only partially but not by more than 50%.

2. Ceramic multi-layer filter according to claim 1, in which, when forming more than two layers as layers on the support, the particle size of the ceramic material diminishes in the direction going away from the support.

3. Ceramic multi-layer filter according to claim 1, in which the ceramic particles of the support layer and at least the one additional layer are comprised of layers of the same ceramic material, preferably silicon carbide or aluminum oxide.

4. Ceramic multi-layer filter according to claim 1, in which the ceramic material in all layers of the filter and the material which wets the surfaces of the ceramic particles, possess the same composition in all layers of the filter.

5. Ceramic multi-layer filter according to claim 1, in which the material that wets the surface of the ceramic particles and forms the spot and/or surface connection between the ceramic particles is a borosilicate glass or an aluminum borosilicate glass or a lithium aluminum silicate glass.

6. Ceramic multi-layer filter according to claim 1, in which the quantity of material, which wets the surface of the ceramic particles and forms the spot and/or surface connection between the ceramic particles, is selected in terms of size in such a way that the pore volume and the pore size between the particles is reduced only slightly by the material, preferably not more than 10%.

7. Ceramic multi-layer filter according to claim 1, in which the ceramic particles of at least two layers differentiate from one another in a ratio of 1 : 5 to 1 : 10 in terms of their average particle size.

8. Ceramic multi-layer filter according to claim 1, in which the particles of the support layer have an average particle size of 20 to 50µm.

9. Process for producing a ceramic multi-layer filter according to one of claims 1 through 8, in which at least two ceramic slurries are manufactured from at least two ceramic powders of the same or different composition but different particle sizes with the additional of known forming and sintering auxiliary agents, where the particles of the ceramic powders are wet with a material or a material is added to the ceramic slurries in powdered form, which wets the surface of the ceramic particle well with a temperature increase and has the same or approximately the same thermal coefficient of expansion as the ceramic particles, and which does not or only slightly alters the particle size, particle morphology and particle composition/crystal structure compared to those of the powder that is used and which forms spot and/or surface connections in the case of a temperature change between the particles, where the material is only added in the quantity or in the quantity that coats the ceramics particles so that the pore quantity and pore size between the particles is reduced by the material only slightly or only partially but not more than 50%, one or more layers are formed and dried from the slurries, where, after partial or complete drying of a layer, another layer with ceramic particles with a smaller particle size than the already dried layer can be formed

on it, and at least two layers are placed over one another and/or connected with one another and jointly subjected to a temperature increase, which leads to the formation of the spot and/or surface connection between the ceramic particles by the material.

10. Process according to claim 9, in which a material is used that forms a liquid phase during the temperature increase.

11. Process according to claim 9, in which a material is used whose liquid phase has a high surface tension.

12. Process according to claim 9, in which a material is used whose liquid phase partially or completely crystallizes during cooling.

13. Process according to claim 9, in which, when adding pulverized material to the ceramic slurries, it is distributed homogenously in the ceramic slurry and, after drying, is distributed homogeneously on the surface of the ceramic particles.

14. Process according to claim 9, in which the ceramic particles are wet with the material before manufacturing the ceramic slurry.

15. Process according to claim 14, in which the ceramic particles are wet with the material by means of chemical methods, preferably by co-precipitation.

16. Process according to claim 9, in which the temperature increase is carried out under air.

17. Process according to claim 9, in which the temperature is increased to a range between 700° C and 1200° C.

18. Process according to claim 9, in which the ceramic powders used are closely

fractionated abrasive powders.

Add A5 → on substract

add B5 →